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FEDERAL COMMUNICATIONS COMMISSION

47 CFR Parts 1, 2, 25 and 27

[GN Docket No. 18-122; RM-11791; RM-11778; DA 19-678]

Wireless Telecommunications Bureau, International Bureau, Office of Engineering and Technology, and Office of Economics and Analytics Seek Focused Additional Comment in 3.7-4.2 GHz Band Proceeding

AGENCY: Federal Communications Commission.

ACTION: Proposed rule.

SUMMARY: In this document, we invite interested parties to supplement the record to address issues raised by commenters in response to the Commission's July 2018 Notice of Proposed Rulemaking. Specifically, among other issues, the Bureaus and Offices seek comment on proposed auction-based approaches, other transition mechanisms to introduce new flexible-use licensing in the band, appropriate repurposing methodologies, Fixed Satellite Service earth station protection criteria, and technical rules, as well as specifically seeking additional comment on the recent filings by: ACA Connects – America's Communications Association (ACA Connects), the Competitive Carriers Association (CCA), Charter Communications, Inc. (Charter); AT&T; and the Wireless Internet Service Providers Association (WISPA), Google, and Microsoft.

DATES: Comments are due on or before August 7, 2019; reply comments on or before August 14, 2019.

ADDRESSES: You may submit comments, identified by GN Docket No. 18-122, by any of the following methods:

- Federal Communications Commission's website: <https://www.fcc.gov/ecfs/>. Follow the instructions for submitting comments.
- People with Disabilities: Contact the FCC to request reasonable accommodations (accessible format documents, sign language interpreters, CART, etc.) by email: FCC504@fcc.gov, phone: 202-418-

0530 or TTY: 202-418-0432.

For detailed instructions for submitting comments and additional information on the rulemaking process, see the **SUPPLEMENTARY INFORMATION** section of this document.

FOR FURTHER INFORMATION CONTACT: Matthew Pearl of the Wireless Telecommunications Bureau, at Matthew.Pearl@fcc.gov or (202)418-2607. For information regarding Initial Paperwork Reduction Act, contact Cathy Williams, Office of Managing Director, at (202) 418-2918 or Cathy.Williams@fcc.gov.

SUPPLEMENTARY INFORMATION: This is a summary of the Commission's document, DA 19-678, (WTB, IB, OET, OEA July 19, 2019), GN Docket No. 18-122, RM-11791, RM-11778. The complete text of this document, as well as comments, reply comments, and ex parte submissions, is available for public inspection and copying from 8 a.m. to 4:30 p.m. Eastern Time (ET) Monday through Thursday or from 8 a.m. to 11:30 a.m. ET on Fridays in the FCC Reference Information Center, 445 12th Street SW, Room CY-A257, Washington, DC 20554. The complete text is available on the Commission's website at <http://wireless.fcc.gov>, or by using the search function on the ECFS web page at <http://www.fcc.gov/cgb/ecfs/>. Alternative formats are available to persons with disabilities by calling the Consumer & Governmental Affairs Bureau at (202) 418-0530 (voice), (202) 418-0432 (tty).

Comment Filing Procedures

Pursuant to sections 1.415 and 1.419 of the Commission's rules, 47 CFR 1.415, 1.419, interested parties may file comments and replies on or before the dates indicated on the first page of this document.

Comments and replies may be filed using the Commission's Electronic Comment Filing System (ECFS).

- **Electronic Filers:** Comments may be filed electronically using the Internet by accessing ECFS: <https://www.fcc.gov/ecfs/>. Filers should follow the instructions provided on the website for submitting comments. In completing the transmittal screen, filers should include their full name, U.S. Postal Service mailing address, and the applicable docket number, GN Docket No. 18-122.

- Paper Filers: Parties who choose to file by paper must file an original and one copy of each filing. If more than one docket or rulemaking number appears in the caption of this proceeding, filers must submit two additional copies for each additional docket or rulemaking number. Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission.
 - All hand-delivered or messenger-delivered paper filings for the Commission's Secretary must be delivered to FCC Headquarters at 445 12th Street, SW, Room TW-A325, Washington, DC 20554. The filing hours are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes and boxes must be disposed of before entering the building.
 - Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9050 Junction Drive, Annapolis Junction, MD 20701.
 - U.S. Postal Service first-class, Express, and Priority mail must be addressed to 445 12th Street, SW, Washington DC 20554

People with Disabilities. To request materials in accessible formats for people with disabilities (Braille, large print, electronic files, audio format), send an e-mail to fcc504@fcc.gov or call the Consumer and Governmental Affairs Bureau at 202-418-0530 (voice), 844-432-2275 (videophone), or 202-418-0432 (TTY).

Initial Paperwork Reduction Act of 1995 Analysis

This document does not contain proposed information collection requirements subject to the Paperwork Reduction Act of 1995, Public Law 104-13. In addition, therefore, it does not contain any proposed information collection burden for small business concerns with fewer than 25 employees, pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, *see* 44 U.S.C. 3506(c)(4).

Ex Parte Rules

Pursuant to section 1.1200(a) of the Commission's rules, this document shall be treated as a "permit-but-disclose" proceeding in accordance with the Commission's ex parte rules. Persons making ex parte presentations must file a copy of any written presentation or a memorandum summarizing any oral presentation within two business days after the presentation (unless a different deadline applicable to the Sunshine period applies). Persons making oral ex parte presentations are reminded that memoranda summarizing the presentation must (1) list all persons attending or otherwise participating in the meeting at which the ex parte presentation was made, and (2) summarize all data presented and arguments made during the presentation. If the presentation consisted in whole or in part of the presentation of data or arguments already reflected in the presenter's written comments, memoranda or other filings in the proceeding, the presenter may provide citations to such data or arguments in his or her prior comments, memoranda, or other filings (specifying the relevant page and/or paragraph numbers where such data or arguments can be found) in lieu of summarizing them in the memorandum. Documents shown or given to Commission staff during ex parte meetings are deemed to be written ex parte presentations and must be filed consistent with section 1.1206(b). In proceedings governed by section 1.49(f) or for which the Commission has made available a method of electronic filing, written ex parte presentations and memoranda summarizing oral ex parte presentations, and all attachments thereto, must be filed through the electronic comment filing system available for that proceeding, and must be filed in their native format (e.g., .doc, .xml, .ppt, searchable .pdf). Participants in this proceeding should familiarize themselves with the Commission's ex parte rules.

Synopsis

1. By this document, the Wireless Telecommunications Bureau, International Bureau, Office of Engineering and Technology, and Office of Economics and Analytics (Bureaus and Offices) invite interested parties to supplement the record to address issues raised by commenters in response to the Commission's July 2018 Notice of Proposed Rulemaking in GN Docket No. 18-122 (33 FCC Rcd 6915) (Notice). In the document, the Commission sought comment on several approaches, including auction-based approaches, for making some or all of the 3.7-4.2 GHz band (C-Band) available for terrestrial,

flexible use. The Commission also sought comment on other issues essential to the introduction of new terrestrial wireless services in the band, including incumbent protection criteria, technical and licensing rules, and appropriate methodologies for transitioning or protecting existing Fixed Satellite Service and Fixed Service operators in the band.

2. In response to the document, commenters proposed auction-based approaches and other transition mechanisms to introduce new flexible-use licensing in the band. Commenters also espoused different views on appropriate repurposing methodologies, Fixed Satellite Service earth station protection criteria, technical rules, and other issues raised in the document. The Bureaus and Offices seek additional comment on the recent filings by: (1) ACA Connects – America’s Communications Association (ACA Connects), the Competitive Carriers Association (CCA), Charter Communications, Inc. (Charter) (collectively, ACA Connects Coalition); (2) AT&T; and (3) the Wireless Internet Service Providers Association (WISPA), Google, and Microsoft.

3. The ACA Connects Coalition, which collectively represents both incumbent C-band earth station users and wireless providers that seek to use this spectrum to provide 5G services, recently submitted a joint proposal for repurposing a large portion of the C-band for 5G use. Their proposal consists of three key elements that would make 370 megahertz of C-band spectrum available for flexible wireless use on a nationwide basis: (1) a Commission-driven auction that would award new terrestrial licenses and assign obligations for transition costs; (2) a plan to transition certain Fixed Satellite Service earth station operators to fiber; and (3) a plan for satellite operators to repack remaining earth station users to the upper portion of the band.

4. Implementing such a proposal would entail a multi-step, Commission-driven transition process. First, the Commission would conduct an auction to award new flexible-use licenses—this could be a traditional auction, such as an auction of overlay license rights, or potentially an incentive auction. Under such an approach, bidders acquiring new terrestrial licenses through the auction would be required by rule to contribute to a fund that would cover the costs of the fiber transition, reimburse satellite

operators and their customers, and further compensate operators and users. Incumbent earth stations would be mandatorily relocated and repacked.

5. The remaining elements of the ACA Connects Coalition proposal involve using the common pool of funds for a combination of transitioning certain earth stations to fiber, repacking remaining earth station users to the upper portion of the band, and providing compensation to satellite providers. Video programmers and multichannel video programming distributors (MVPDs) would transition the delivery of video programming to MVPDs from C-band Fixed Satellite Service use to terrestrial fiber delivery. Simultaneous with the MVPD transition, satellite operators would repack services used by non-MVPD earth station users, such as radio and television broadcasters, to the upper portion of the C-band, and resources would be made available to protect these remaining C-band customers from harmful interference by out-of-band 5G emissions, using interference prevention measures such as installing antenna filters, repointing antennas, and changing antennas' frequencies or polarization. The common pool of funds would be used to further compensate satellite operators for lost revenue resulting from the transition to fiber. In the document, the Commission sought comment on a similar hybrid approach to transition the band, whereby satellite operators would relinquish their rights to a certain amount of spectrum that would then be made available for terrestrial use nationwide, and additional spectrum could be made available on a geographic basis in areas where it is cost-efficient to transition earth stations to other forms of transmission, such as fiber. The Commission noted that fiber is most prevalent in urban areas, and sought comment on whether it would be feasible to transition certain regions based on the existence of fiber, and if so, how such a transition could be accomplished. The Bureaus and Offices seek comment on each of the elements of the ACA Connects Coalition proposal, both individually and as a package, and how each element could further the Commission's goal of maximizing the terrestrial use of this spectrum while protecting incumbent earth station users.

6. The Bureaus and Offices also seek comment on the viability of variants on the ACA Connects Coalition approach. For example, the Bureaus and Offices seek comment on mandatory

relocation and repacking requirements that would use fiber delivery (potentially redundant fiber delivery) but maintain the C-band delivery of MVPD video programming via non-urban “super” head-ends. How much spectrum could be cleared—nationwide or regionally—using this approach? What transport facilities would be required to transmit video content from consolidated earth station receive sites (i.e., satellite dish farms) to endpoints closer to existing receive-only earth stations or would the data centers just bypass satellite dish farms? How would the number and location of those consolidated receive sites be determined and who would own and operate those sites? How would sufficient network reliability be achieved? Is complete network redundancy necessary or can required reliability levels be achieved through other means? Should winning bidders have the option to build the redundant fiber themselves (or agree amongst themselves on who should build the redundant fiber) rather than contribute to a pool? The Bureaus and Offices seek comment on the likely costs of constructing and maintaining fiber networks and interconnecting the head-ends to ensure fiber delivery to the locations of existing earth stations. To what extent is fiber readily available to all affected end users? How and to what extent should the costs of the fiber transition be addressed? How could the Commission best align the incentives of those building any fiber delivery routes with those required to pay for such routes? More broadly, what if any rights to mandatorily relocate and repack existing earth stations should accrue to any new terrestrial licensees? What obligations should redound with such rights—for example, what costs must be covered by any such licensees (and particularly are a lost opportunity to receive revenues a valid cost for these purposes)? The Bureaus and Offices also seek comment on how long it would take to implement this transition.

7. In addition, the Bureaus and Offices seek comment on appropriate characteristics of the licenses that could be offered at auction to promote a transition and accomplish the type of geographic clearing and fiber transition described in the ACA Connects Coalition Proposal or through centralized earth station receive sites. Would these approaches work better with particular license parameters (i.e., larger geographic license areas) and service rules that differ from those proposed in the document? The Bureaus and Offices also seek comment on how the Commission’s approaches during the AWS-3 and

800 MHz transitions might inform this proceeding. For example, should the Commission designate a Transition Administrator or require the creation of a clearinghouse to facilitate the sharing of the costs for mandatory relocation and repacking? The Bureaus and Offices seek comment on these and any other relevant issues in the record.

8. On May 23, 2019, AT&T submitted comments responding to the C-Band Alliance's proposed technical criteria for operations in the band, particularly with respect to co-existence with incumbent Fixed Satellite Service earth stations. AT&T asserts that the C-Band Alliance's proposed technical criteria would constrain 5G deployment, and it proposes an alternate band plan to address its concerns. AT&T recommends dividing the 3.7-4.2 GHz band into three segments: (1) a largely unrestricted mobile terrestrial 5G segment in the bottom of the band ("Unrestricted Licenses"); (2) "Adjacent Licenses" in the middle of the band that would have to coordinate with or mitigate impact on Fixed Satellite Service; and (3) remaining Fixed Satellite Service spectrum in the top of the band. Unrestricted Licenses could operate using full power and would not be obligated to coordinate with Fixed Satellite Service earth stations; Adjacent Licenses would operate using lower power or subject to other limitations, or would be obligated to coordinate with nearby Fixed Satellite Service earth stations. AT&T also describes a number of technical issues that would benefit from further analysis in the record, including technical criteria necessary to determine appropriate protection thresholds for in-band and adjacent band Fixed Satellite Service earth stations, receiver filter performance, the ongoing operational needs of Fixed Satellite Service earth stations in the band, and out-of-band emission limits for terrestrial wireless devices.

9. On July 15, 2019, WISPA, Google, and Microsoft filed a study conducted by Reed Engineering, which analyzed Fixed Satellite Service and fixed wireless point-to-multipoint co-channel coexistence in the 3.7-4.2 GHz band. Among other conclusions, the Reed Study suggests that exclusion zones of about 10 kilometers are sufficient to protect most Fixed Satellite Service earth stations from harmful interference caused by properly-engineered co-channel point-to-multipoint broadband systems.

The propagation model used in the study relied on Fixed Satellite Service earth station characteristics that require them to point upwards towards the geostationary satellite arc. Thus, the earth stations are specifically designed to mitigate their response to signals arriving from the horizon, such as terrestrial point-to-multipoint links. Additionally, the study relied on the directional nature of fixed service antennas and clutter to assume reduced emissions at earth stations.

10. The Bureaus and Offices seek comment on the technical issues raised by the ACA Connects Coalition proposal, AT&T's proposal, and the Reed Study, and on the questions raised therein. Specifically, what are the appropriate interference thresholds and protection criteria, how should they be modeled, and under what deployment assumptions? That is, how should protection criteria be calculated and implemented to achieve both in-band and adjacent band Fixed Satellite Service protections through coordination or other protection mechanisms? Should these criteria differ for telemetry, tracking, and command earth stations? Given the needs of next-generation wireless networks and the need to ensure continuity of service for current users of Fixed Satellite Service earth stations, what are the appropriate technical parameters for terrestrial base stations and end user devices in the band, including transmit power limits and out-of-band emission limits? The Bureaus and Offices also seek comment on suggestions by the ACA Connects Coalition, AT&T, and the Reed Study on ways to increase efficient shared use of the C-band through validation of earth station filters, protection zones around stations, analysis of the relevant parameters of earth stations for protection (e.g., elevation angles, range of pointing angles, and frequencies that are used), and other technical matters. For example, which filters are actually realizable and available to achieve the sharing goals of the various proposals? Is it possible to achieve the short-term sharing goals of the proposals given the need to retrofit multiple types of Fixed Satellite Service earth station front-end elements (e.g., Low Noise Block downconverter/filter) and the susceptibility of Fixed Satellite Service receivers to Passive Intermodulation?

11. The Bureaus and Offices also seek comment on appropriate parameters to manage co-existence of terrestrial stations with earth stations during any band transition where differing amounts of

spectrum might be cleared during different time periods for nearby geographic areas. For example, ACA Connects suggests creating a zone where mobile handsets may have operating restrictions and another zone where base station power flux density would be limited. AT&T suggests that either lower power terrestrial stations or coordination procedures could be used to manage terrestrial operations on spectrum adjacent to fixed satellite service operations. Under either of these proposals, what technical parameters regarding power levels, power flux density levels, and coordination procedures are appropriate to achieve co and adjacent band operation during and after any transition period? The Bureaus and Offices also seek additional quantitative analysis and over-the-air field test results to strengthen the record on the service impact of specific interference levels, with results that can be independently reproduced by third parties.

12. Over the past year, a robust and diverse record has been developed in this proceeding, providing new insights into the issues raised in the document. To ensure that the Commission has the information it needs to complete its deliberations, the Bureaus and Offices seek comment on the specific questions raised above. To that end, all commenters are encouraged to provide detailed proposals, including technical assessments, cost benefit analyses, and projected timelines to support their positions.

FEDERAL COMMUNICATIONS COMMISSION.

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